The Management University of Africa

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UNDERGRADUATE UNIVERSITY EXAMINATIONS

SCHOOL OF MANAGEMENT AND LEADERSHIP

DEGREE OF BACHELOR OF COMMERCE/ MANAGEMENT AND LEADERSHIP

BCM 112/BML 103 : **BUSINESS MATHEMATICS**

DATE: ***4th DECEMBER 2014***

DURATION: 2 HOURS

MAXIMUM MARKS: 70

INSTRUCTIONS:

1. Write your registration number on the answer booklet.
2. **DO NOT** write on this question paper.
3. This paper contains **SIX (6)** questions.
4. Question **ONE** is compulsory.
5. Answer any other **THREE** questions.
6. Question **ONE** carries **25 MARKS** and the rest carry **15 MARKS** each.
7. **Write all your answers in the Examination answer booklet provided.**

QUESTION ONE

a) Compare and contrast between Laspeyre and Paasche Price indices

(4 marks)

b) Find the nature of the turning points on the curve represented by the following function

$y=x^3-27x+35$ **(5 marks)**

c) Solve the following set of simultaneous equation using matrix method

(4 marks)

$3x+4y=10$

$2x+7y=11$

d) Using separate Venn diagram represents the following sets: given

V = (a, b, c, d, e, f, g, h)

A = (b, c, d)

B = (d, e, f)

i) $A \cup B$

ii) $A \cap B$

iii) $A \cap B^c$

iv) $(A \cup B)^c$ **(12 marks)**

QUESTION TWO

Explain the following sampling techniques **(15 marks)**

i) Stratified sampling

ii) Multistage sampling

iii) Quota sampling

iv) Simple random sampling

v) Systematic sampling

QUESTION THREE

a) From the following data relating to working class consumer price index of Nairobi City, calculate index number for 2011 taking 2010 as the base

(11 marks)

Group	Group Indices		
	Weight	2010	2011
Food	48	110	130
Clothing	8	120	125
Fuel	7	110	120
Rent	13	100	100
Miscellaneous	14	115	135

b) Evaluate **(4 marks)**

$$\int_{2}^{5} (10x^3 + 4x\text{-}1)\,dx$$

QUESTION FOUR

The distributions of monthly income per family are as shown below:

Monthly income	Cumulative frequencies
80 - 120	30
120 -160	55
160 – 200	75
200 – 240	90
240 – 280	100

Required to find:

i) The mean monthly income **(4 marks)**

ii) The standard deviation **(9 marks)**

iii) Coefficient of variation **(2 marks)**

QUESTION FIVE

a) State the advantages of using tables as a means of presenting data **(4 marks)**

b) A number of families were measured by the number of children to give the following frequency distribution:

No. of children:	0	1	2	3	4	5 or more
No. of families:	12	28	22	8	2	2

Use this information to calculate the probability that another family of this type will have:

(i) 2 children **(2 marks)**

(ii) 3 or more children **(2 marks)**

(iii) Less than 2 children **(2 marks)**

c) Let $A = \begin{pmatrix} 2 & 1 \\ 3 & 0 \\ 4 & 2 \end{pmatrix}$

And $B = \begin{pmatrix} 1 & -1 & 4 \\ 2 & 0 & 5 \end{pmatrix}$

Find $|C| = A \times B$ and show that C is a singular matrix **(5 marks)**

QUESTION SIX

a) Solve the following equation using quadratic root formula **(6 marks)**

$$\frac{X-3}{X} = \frac{2X+1}{X-1}$$

b) Highlight any 5 limitations of index numbers **(5 marks)**

c) Distinguish between **(4 marks)**

i) Discrete variables and continuous variables

ii) Census and survey